IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BOARD OF PATENT APPEALS AND INTERFERENCES

In Re Application of:
Arturo A. Rodriguez

Serial No.:
09/736,661

Filed:
December 14, 2000

For:
System and Method for Adaptive Video Processing with Coordinated Resource Allocation

Confirmation No. **8279**

Group Art Unit:
2621

Examiner:
An, Shawn S.

Docket No.:
A-6280

APPEAL BRIEF UNDER 37 C.F.R. § 41.37

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
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Sir:

This Appeal Brief under 37 C.F.R. § 41.37 is submitted in support of the Notice of Appeal filed December 1, 2008, responding to the outstanding non-final Office Action mailed July 29, 2008 (Part of Paper No./Mail Date 20080723).

I. REAL PARTY IN INTEREST

The real party in interest of the instant application is Scientific-Atlanta, Inc., having its principal place of business at 5030 Sugarloaf Parkway, Lawrenceville, GA 30044. Scientific-Atlanta, Inc., the assignee of record, is wholly owned by Cisco Systems, Inc.

II. RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences.

III. STATUS OF THE CLAIMS

Claims 38, 53-55, 66-78, 80-82, and 85-88 stand rejected by the non-final Office Action mailed July 29, 2008, and are the subject of this appeal. Claims 1-37, 39-52, 56-65, 79, and 83-84 were cancelled during prosecution.

IV. STATUS OF AMENDMENTS

There have been no claim amendments made after the final Office Action (mailed April 22, 2008). All amendments made before the final Office Action (mailed April 22, 2008) and the outstanding non-final Office Action (mailed July 29, 2008) have been entered. The claim listing in section VIII (below) represents the present state of the claims.

V. SUMMARY OF THE CLAIMED SUBJECT MATTER

Embodiments of the claimed subject matter are summarized below with reference numbers and references to the written description ("specification") and drawings. The subject matter described below appears in the original disclosure at least where indicated, and may further appear in other places within the original disclosure.

Embodiments of the claimed subject matter, such as those defined by independent claim 38, define a method for adapting to resource constraints of a digital home communication terminal (DHCT). (See, *e.g.*, p. 13 lines 1-15; p. 15 line 20 to p. 16 line 10.) The method comprises the step of providing a digital home communication terminal (DHCT). (See, *e.g.*, p. 7 line 10 to p. 8 line 10; FIG. 2, ref. num. 16.) The DHCT (see, *e.g.*, FIG. 2, ref. num. 16) is configured to operate in a non-resource constrained mode and a plurality of resource constrained modes. (See, *e.g.*, p. 13 line 1-10, p. 15 line 10-32.) The method also comprises the step of determining whether one of the resource-constrained modes or the non-resource constrained mode is to be initiated. (See, *e.g.*, p. 26 lines 5-20.) The method also comprises the step of operating the DHCT (see, *e.g.*, FIG. 2, ref. num. 16) in the determined resource-constrained mode responsive to determining that one of the resource-constrained modes is to be initiated. (See, *e.g.*, p. 16 lines 10-15; p. 17 lines 5-10; p. 26 lines 5-10.) The step of operating comprises retrieving a set of reconstructed decompressed video frames (see, *e.g.*, p. 26 line 5-32) from a first portion of a memory component (see, *e.g.*, p. 13 line 30 to p. 14 line 10; FIG. 5, ref. num. 30), wherein the memory component stores compressed video frames in a distinct second portion (see, *e.g.*, p. 13 line 30 to p. 14 line 10; FIG. 5, ref. num. 62), wherein the

set of video frames corresponds to a video picture (see, *e.g.*, p. 20 lines 1-30). The step of operating further comprises transferring the set of retrieved reconstructed decompressed video frames to a display device while downscaling the video picture in transit to the display device. (See, *e.g.*, p. 24 lines 10-20, p. 26 lines 1 to 20; FIG. 6, ref. num. 83.)

Embodiments of the claimed subject matter, such as those defined by independent claim 53, define a method for adapting to resource constraints of a digital communication terminal (DHCT). (See, *e.g.*, p. 13 lines 1-15; p. 15 lines 20 to p. 16 line 10.) The method comprises the step of providing a digital home communication terminal (DHCT). (See, *e.g.*, p. 7 line 10 to p. 8 line 10; FIG. 2, ref. num. 16.) The DHCT (see, *e.g.*, FIG. 2, ref. num. 16) is configured to operate in a non-resource constrained mode and a plurality of resource-constrained modes. (See, *e.g.*, p. 13 line 1-10, p. 15 line 10-32.) The method also comprises the step of determining whether one of the resource-constrained modes is to be initiated. (See, *e.g.*, p. 26 lines 5-20.) The method further comprises the step of initiating the resource-constrained mode responsive to determining that one of the resource-constrained modes is to be initiated. (See, *e.g.*, p. 16 lines 10-15; p. 17 lines 5-10; p. 26 lines 5-10.) The initiating step comprises retrieving, from a first portion of a memory component, a set of compressed frames. (See, *e.g.*, p. 26 line 5-32.) The initiating step also comprises storing, in a second and distinct portion of the memory component, a set of decoded frames corresponding to the set of compressed frames, each of the set of decoded frames being at a first spatial resolution. (See, *e.g.*, p. 13 line 30 to p. 14 line 10; FIG. 5.) The initiating step also comprises retrieving, from the second and distinct portion of the memory component, the set of decoded frames. (See, *e.g.*, p. 24 lines 10-20, p. 26 lines 1 to 20.) The initiating step also comprises transferring the retrieved set of decoded frames to a display device while scaling the frames in transit to the display device to a second spatial resolution without storing the frames in the memory component (see, *e.g.*, p. 24 lines 10-20, p. 26 lines 1 to 20; FIG. 6, ref. num. 83), wherein the second spatial resolution is smaller than the first spatial resolution. (See, *e.g.*, p. 24 lines 10-20, p. 26 lines 1 to 20.)

Embodiments of the claimed subject matter, such as those defined by independent claim 54, define a digital home communication terminal (DHCT). (See, *e.g.*, p. 7 line 10 to p. 8 line 10; FIG. 2, ref. num. 16; p. 13 lines 1-15; p. 15 lines 20 to p. 16 line 10.) The DHCT (see, *e.g.*, FIG. 2, ref. num. 16) comprises logic configured to operate the DHCT (see, *e.g.*, FIG. 2, ref. num. 16) in a non-resource constrained mode and a plurality of resource-constrained modes. (See, *e.g.*, p. 13 line 1-10, p. 15 line 10-32.) The DHCT (see, *e.g.*, FIG. 2, ref. num. 16) also comprises logic configured to determine whether one of the resource-constrained modes is to be initiated. (See, *e.g.*, p. 26 lines 5-20.) The DHCT (see, *e.g.*, FIG. 2, ref. num. 16) also comprises logic configured to, responsive to determining that the resource-constrained modes is to be initiated, initiate the resource-constrained mode. (See, *e.g.*, p. 16 lines 10-15; p. 17 lines 5-10; p. 26 lines 5-10) including: logic configured to retrieve, from a first portion of a memory component, a set of compressed frames (See, *e.g.*, p. 26 line 5-32); logic configured to store, in a second and distinct portion of the memory component, a set of decoded frames corresponding to the set of compressed frames, each of the set of decoded frames being at a first spatial resolution (See, *e.g.*, p. 13 line 30 to p. 14 line 10; FIG. 5); logic configured to retrieve, from the memory component, the set of decoded frames. (See, *e.g.*, p. 24 lines 10-20, p. 26 lines 1 to 20); and logic configured to transfer the set of decoded frames to a display device while scaling the frames in transit to the display device to a second spatial resolution without storing the frames in the memory component (see, *e.g.*, p. 24 lines 10-20, p. 26 lines 1 to 20; FIG. 6, ref. num. 83), wherein the second spatial resolution is smaller than the first spatial resolution. (See, *e.g.*, p. 24 lines 10-20, p. 26 lines 1 to 20.)

Embodiments of the claimed subject matter, such as those defined by independent claim 55, define a method for adapting to resource constraints of a digital home communication terminal (DHCT). (See, *e.g.*, p. 7 line 10 to p. 8 line 10; FIG. 2; p. 13 lines 1-15; p. 15 lines 20 to p. 16 line 10.) The method comprises the step of providing a digital home communication terminal (DHCT). (See, *e.g.*, p. 7 line 10 to p. 8 line 10; FIG. 2, ref. num. 16.) The DHCT (see,

e.g., FIG. 2, ref. num. 16) is configured to operate in a non-resource constrained mode and a plurality of resource-constrained modes. (See, *e.g.*, p. 13 line 1-10, p. 15 line 10-32.) The method also comprises the step of receiving, in a memory component video frames (see *e.g.*, p. 14 lines 1-20) comprising a complete picture (see, *e.g.*, p. 20 lines 1-30). The method also comprises determining whether one of the resource-constrained modes is to be initiated. (See, *e.g.*, p. 26 lines 5-20.) The method also comprises the step of initiating the resource-constrained mode responsive to determining that one of the resource-constrained modes is to be initiated. (See, *e.g.*, p. 16 lines 10-15; p. 17 lines 5-10; p. 26 lines 5-10.) The initiating step includes retrieving the video frames from the memory component. (See, *e.g.*, p. 26 line 5-32). The initiating step also includes transferring the retrieved video frames to a display device while downscaling the picture in transit to the display device. (See, *e.g.*, p. 24 lines 10-20, p. 26 lines 1 to 20; FIG. 6, ref. num. 83.)

Embodiments of the claimed subject matter, such as those defined by independent claim 66, comprise a computer readable medium containing a program (see, *e.g.*, p. 11, line 15 to p. 12 line 5) for use in a digital home communication terminal (DHCT) to adapt to resource constraints (see, *e.g.*, p. 7 line 10 to p. 8 line 10; FIG. 2; p. 13 lines 1-15; p. 15 lines 20 to p. 16 line 10). The program comprises logic for performing the steps of: providing a digital home communication terminal (DHCT) (see, *e.g.*, p. 7 line 10 to p. 8 line 10; FIG. 2, ref. num. 16) , wherein DHCT (see, *e.g.*, FIG. 2, ref. num. 16) is configured to operate in a non-resource constrained mode and a plurality of resource-constrained modes (see, *e.g.*, p. 13 line 1-10, p. 15 line 10-32); receiving, in a memory component, video frames (see *e.g.*, p. 14 lines 1-20) comprising a complete picture (see, *e.g.*, p. 20 lines 1-30); determining whether one of the resource-constrained modes is to be initiated (see, *e.g.*, p. 26 lines 5-20); responsive to determining that one of the resource-constrained modes is to be initiated, initiating the resource-constrained mode (see, *e.g.*, p. 16 lines 10-15; p. 17 lines 5-10; p. 26 lines 5-10), including: retrieving the video frames from the memory component (see, *e.g.*, p. 26 line 5-32); and

transferring the retrieved video frames to a display device while downscaling the picture in transit to the display device (see, *e.g.*, p. 24 lines 10-20, p. 26 lines 1 to 20; FIG. 6, ref. num. 83).

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

The following grounds of rejection are to be reviewed on appeal.

A. Claim 66 stands rejected under 35 U.S.C § 101 as allegedly directed to non-statutory matter.

B. Claims 38, 53-55, 66-78, 80-82, and 85-88 stand rejected under 35 U.S.C § 103(a) as allegedly unpatentable over *MacInnis et al.* (U.S. 6,570,579) in view of *Boyce et al.* (U.S. 5,614,952) and *Kalra et al.* (U.S. 5,953,506)

VII. ARGUMENT

A. Rejection of Claim 66 under 35 U.S.C. §101

Claim 66 is rejected under §101 as allegedly directed to non-statutory subject matter. The outstanding non-final Office Action alleges that:

> The preamble of claim 66 comprises non-statutory subject matter.
> The following are examples of acceptable language in overcoming non-statutory subject matter:
> A. "A computer readable storing a computer program, …";
> B. "A computer readable embodied with a computer program, …";
> C. "A computer readable encoded with a computer program, …"'
> (outstanding non-final Office Action, p. 3)

The outstanding non-final Office Action thus appears to contend that the preamble of claim 66 ("A computer readable medium containing a program for use in a digital home communication terminal (DHCT) to adapt to resource constraints, the program comprising logic for performing the steps of") is *per se* improper. Appellant respectfully disagrees. The Office Action has provided no legal basis for this *per se* requirement. Neither the Federal Circuit nor the BPAI has adopted a rule indicating that specific preambles are acceptable under §101 while others are

not. Therefore the rejection is legally deficient and should be overturned by the Board for at least this reason.

Furthermore, Appellant submits that claim 66 does comply with §101 since it recites functional descriptive material recorded on a machine-readable medium. Compare *In re Lowry*, 32 F.3d 1579, 1583-84, 32 USPQ2d 1031, 1035 (Fed. Cir. 1994)(discussing patentable weight of data structure limitations in the context of a statutory claim to a data structure stored on a computer readable medium that increases computer efficiency) and In re *Warmerdam*, 33 F.3d *1354, 1360-61, 31 USPQ2d *1754, 1759 (claim to computer having a specific data structure stored in memory held statutory product-by-process claim) with *Warmerdam*, 33 F.3d at 1361, 31 USPQ2d at 1760 (claim to a data structure *per se* held nonstatutory). Therefore the rejection should be overturned by the Board for this reason also.

B. Rejection of Claims 38, 53-55, 66-78, 80-82, and 85-88 under 35 U.S.C. §103: *MacInnis et al.* and *Boyce et al.* and *Kalra et al.*

Claims 38, 53-55, 66-78, 80-82, and 85-88 are rejected under §103(a) as allegedly obvious over *MacInnis et al.* and *Boyce et al.* and *Kalra et al.* Appellant respectfully requests that this rejection be overturned. It is well established at law that, for a proper rejection of a claim under 35 U.S.C. §103 as being obvious based upon a combination of references, the cited combination of references must disclose, teach, or suggest (either implicitly or explicitly) all elements/features/steps of the claim at issue. *See, e.g., In re Dow Chemical*, 5 U.S.P.Q.2d 1529, 1531 (Fed. Cir. 1988); *In re Keller*, 208 U.S.P.Q.2d 871, 881 (C.C.P.A. 1981).

1. Independent Claim 38

a. The proposed combination does not teach "transferring the set of retrieved reconstructed decompressed video frames to a display device while downscaling the video picture in transit to the display device"

The outstanding non-final Office Action admits (p. 4) that *MacInnis et al.* does not disclose this feature. *Kalra et al.* does not discuss downscaling at all. The Office Action alleges

(p. 5) that *Boyce et al.* discloses this feature at Col. 17 lines 66-67, Col. 18 lines 1-16, Col. 2 lines 37-40, and FIG. 4. Appellant respectfully disagrees.

FIG. 4 of *Boyce et al.* is a simple block diagram of Picture-in-Picture Decoder 400, reproduced below:

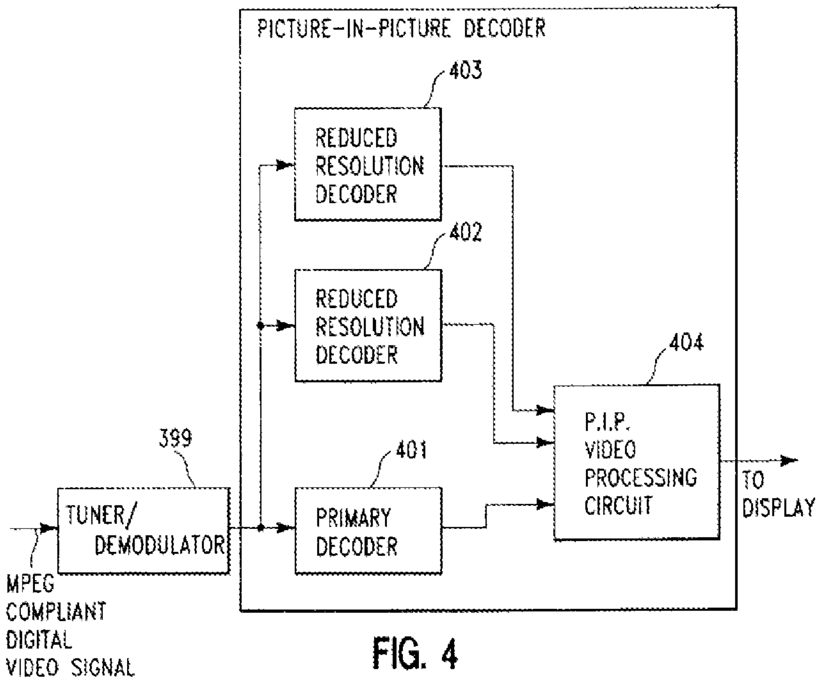

FIG. 4

Appellant assumes (for the sake of argument) that decoder 400 transfers a video picture to a display device, and also downscales the picture. However, Appellant respectfully submits that a high-level block diagram showing ***a path*** between a reduced resolution decoder, a PIP video processing circuit, and a display is not the same as the feature specifically recited in claim 38, namely: “transferring…to a display device ***while downscaling the video picture in transit*** to the display device.”

Accordingly, the proposed combination of *MacInnis et al.* in view of *Boyce et al.* and *Kalra et al.* does not teach at least the above-described feature recited in claim 38. Therefore, a *prima facie* case establishing an obviousness rejection has not been made, and the rejection should be overturned.

b. The proposed combination does not teach “responsive to determining that one of the resource-constrained modes is to be initiated, operating the DHCT in the determined resource-constrained mode, including: retrieving a set of reconstructed decompressed video frames…and transferring the set…”

(1) *MacInnis et al.* does not teach this feature

The Office Action (p. 4) alleges that *MacInnis et al.* Col. 54 lines 36-48 and Col. 55 lines 8-35 teaches a resource constrained mode including retrieving and transferring as recited in claim 38. Appellant respectfully disagrees. The portion of *MacInnis et al.* relied on by the Office Action is directed to a methodology for real-time scheduling of tasks. Appellant assumes (for the sake of argument) that a task with a real-time constraint to execute within a specific time period (*MacInnis et al.*, p. 54 lines 1-25) corresponds to a “resource-constrained mode”, and that a task without real-time constraint (*MacInnis et al.*, p. 55 lines 5-15) corresponds to a “non-resource constrained mode”. Appellant further assumes (for the sake of argument) that determining whether the next task to be executed is a real-time task corresponds to “determining whether one of the resource-constrained modes is to be initiated”, and that executing one of the real-time tasks corresponds to “responsive to determining that the resource-constrained mode is to be initiated, operating the DHCT in the determined resource-constrained mode”.

However, claim 38 further recites that “operating the DHCT in the determined resource-constrained mode” includes specific actions related to video data: “retrieving a set of reconstructed decompressed video frames…and transferring the set of retrieved reconstructed decompressed video frames to a display device…downscaling the video picture”. Although *MacInnis et al.* teaches a graphics display system that retrieves, transfers, and downscales video data (Cols. 5-6), *MacInnis et al.* does <u>not</u> teach that these actions are part of a “resource-constrained mode” or that these actions are performed in response to a mode determination, as recited in claim 38. In fact, the decoding and scaling of video data in Cols. 5-6 of *MacInnis et al.* is not tied in any way to the real-time and non-real-time tasks described in Cols. 54-55 of *MacInnis et al.* Thus, even if *MacInnis et al.* discloses the individual elements discussed above,

the elements in *MacInnis et al.* are not arranged in the manner required by the language of claim 38.

(2) *Kalra et al.* does not teach this feature

The Office Action (pp. 4-5) also alleges that *Kalra et al.* Col. 17 lines 10-67 to Col. 18 lines 1-24 teaches a resource constrained mode including retrieving and transferring, as recited in claim 38. The cited portion of *Kalra et al.* refers to a “bandwidth constraint”, a “CPU constraint” and a “video preference constraint”. Thus, the Office Action (pp. 4-5) appears to allege that the network bandwidth, CPU, and video preference constraints mentioned in *Kalra et al.* correspond to “a plurality of resource-constrained modes” as recited in claim 38. The Office Action (pp. 4-5) appears to further allege that applying one of these constraints corresponds to operating in the resource constrained mode. Appellant respectfully disagrees.

Another portion of *Kalra et al.* describes how the constraints are applied by a server to determine which streams to transmit to a client:

> With respect to step 552 and the determination of which streams to transmit, attention is directed to the flowchart in FIG. 15B1 which indicates the steps that the server takes to determine which of the particular streams to transmit. First, in step 552A, a network bandwidth constraint is applied to determine which bandwidth is available for this particular session. Thereafter, the CPU constraint is also applied as received from the profile from the client computer in order to determine if that constraints which adaptive streams can be transmitted. Thereafter, in step 552C, the video preference is used to further limit which adaptive streams to send and thus make a determination of which adaptive stream to transmit.
> (*Kalra et al.*, Col. 16 lines 50-60)

Kalra et al. specifically teaches that all three constraints are applied, one after the other. In contrast, claim 38 teaches “***determining whether one*** of the resource constrained modes is to be initiated” and “operating the DHCT in the determined resource-constrained mode” ***responsive to*** this determination.

(3) *Boyce et al.* does not teach this feature

The final reference, *Boyce et al.*, does not disclose, teach, or suggest a resource constrained mode, nor does the Office Action allege this.

(4) Conclusion: The proposed combination does not teach this feature

Accordingly, the proposed combination of *MacInnis et al.* in view of *Boyce et al.* and *Kalra et al.* does not teach at least the above-described features recited in claim 38. Therefore, a *prima facie* case establishing an obviousness rejection has not been made, and the rejection of claim 38 should be overturned.

c. The proposed combination is not proper

The proposed combination of *MacInnis et al.* in view of *Boyce et al.* and *Kalra et al.* is improper for at least the reasons discussed below. Therefore, a *prima facie* case establishing an obviousness rejection has not been made, and the rejection of claim 38 should be overturned.

(1) Teachings of *MacInnis et al.*

The Office Action (p. 4) relies on several passages in *MacInnis et al.* for teaching the modes recited in claim 38. These passages describe a methodology for real-time scheduling, as follows:

> The methodology used preferably implements real-time scheduling using Rate Monotonic Scheduling ("RMS"). It is a mathematical approach that allows the construction of provably correct schedules of arbitrary numbers of real-time tasks with arbitrary periods for each of the tasks. This methodology provides for a straight forward means for proof by simulation of the worst case scenario, and this simulation is simple enough that it can be done by hand. RMS, as normally applied, makes a number of simplifying assumptions in the creation of a priority list.
> (*MacInnis et al.*, Col. 54 lines 10-20)
>
> To implement real-time scheduling based on the RMS methodology, first, all of the tasks or clients that need to access memory are preferably listed, not necessarily in any particular order. Next, the period of each of the tasks is preferably determined. For those with specific bandwidth requirements (in bytes per second of memory access), the period is preferably calculated from the bandwidth and the burst size. If the deadline is different from the period for any given task, that is listed as well. The resource requirement when a task is serviced is listed along with the task. In this case, the resource requirement is the number of memory clock cycles required to service the memory access request. The tasks are sorted in order of increasing period, and the result is the set of priorities, from highest to lowest. If there are multiple tasks with the same period, they can be given different, adjacent priorities in any random relative order within the group; or they can be grouped together and served with a single priority, with round-robin arbitration between those tasks at the same priority.

> In practice, the tasks sharing the unified memory do not all have true periodic behavior. In one embodiment of the present invention, a block out timer, associated with a task that does not normally have a period, is used in order to force a bounded minimum interval, similar to a period, on that task. For example a block out timer associated with the CPU has been implemented in this embodiment. If left uncontrolled, the CPU can occupy all available memory cycles, for example by causing a never-ending stream of cache misses and memory requests. At the same time, CPU performance is determined largely by "average latency of memory access", and so the CPU performance would be less than optimal if all CPU memory accessed were consigned to a sporadic server, i.e., at the lowest priority.
>
> In this embodiment, the CPU task has been converted into two logical tasks. A first CPU task has a very high priority for low latency, and it also has a block out timer associated with it such that once a request by the CPU is made, it cannot submit a request again until the block out timer has timed out. In this embodiment, the CPU task has the top priority. In other embodiments, the CPU task may have a very high priority but not the top priority. The timer period has been made programmable for system tuning, in order to accommodate different system configurations with different memory widths or other options.
>
> (*MacInnis et al.*, Col. 55 lines 15-60)

(2) Teachings of *Kalra et al.*

The Office Action (pp. 4-5) relies on several passages in *Kalra et al.* for teaching the modes recited in claim 38. These passages describe a process used by a server to determine which streams to transmit to a client, as follows:

> With respect to step 552 and the determination of which streams to transmit, attention is directed to the flowchart in FIG. 15B1 which indicates the steps that the server takes to determine which of the particular streams to transmit. First, in step 552A, a network bandwidth constraint is applied to determine which bandwidth is available for this particular session. Thereafter, the CPU constraint is also applied as received from the profile from the client computer in order to determine if that constraints which adaptive streams can be transmitted. Thereafter, in step 552C, the video preference is used to further limit which adaptive streams to send and thus make a determination of which adaptive stream to transmit.
>
> (*Kalra et al.*, Col. 16 lines 49-60)

(3) *MacInnis et al.* is not properly combinable with *Kalra et al.*

The proposed combination in the Office Action combines teachings about task scheduling in *MacInnis et al.* with teachings about an adaptive video stream in *Kalra et al.* As an alleged motivation, the Office Action (p. 5) offers the generic motivation of optimization: “reproducing video images with a resolution that is optimized to the capabilities of the client

computer". Appellant submits that "optimization" is not a motivation to combine the specific features of *MacInnis et al.* and *Kalra et al.* that are relied on to reject claim 38. Obviousness can be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so. *In re Kahn*, 441 F.3d 977, 986, 78 USPQ2d 1329, 1335 (Fed. Cir. 2006) (emphasis added). In other words, the relevant motivation is that for combining the teachings in a manner that results in the claimed invention. In this case, when the specific teachings of *MacInnis et al.* and *Kalra et al.* that allegedly result in claim 38 are considered, the combination is improper for at least the following reasons.

In discussing *Kalra et al.*, the Office Action (pp. 4-5) appears to allege that network bandwidth constraints, CPU constraints, and video preference constraints correspond to "a plurality of resource-constrained modes" as recited in claim 38. In discussing *MacInnis et al.*, the Office Action (p. 3) did not allege specifically which features in *MacInnis et al.* correspond to which claimed features. Appellant assumes (for the sake of argument) that a task with a real-time constraint to execute within a specific time period (p. 54 lines 1-25 of *MacInnis et al.*) corresponds to a "resource-constrained mode" and that a task without real-time constraint (p.55 lines 5-15 of *MacInnis et al.*) corresponds to a "non-resource constrained mode".

A person of ordinary skill in the art has no reason to combine *MacInnis et al.*'s teachings about task scheduling with *Kalra et al.*'s teachings about applying constraints in order to determine which streams are transmitted. The Office Action interprets the "modes" recited in claim 38 to correspond to attributes of tasks as taught in *MacInnis et al.*, and simultaneously to correspond to constraints as taught in *Kalra et al.* Even if the interpretation of each reference is reasonable standing alone, the combination does not make sense.

(4) Teachings of *Boyce et al.*

The Office Action relies upon the following passage in *Boyce et al.* for teaching the video processing actions recited in claim 38:

> The primary decoder 401 is responsible for decoding the main picture of a picture-in-picture image while the first and second decoders are responsible for generating separate images which will be displayed in a small area of the main picture. A separate reduced resolution decoder 402 or 403 is used for each additional image that is to be displayed in addition to the main picture.
>
> The output of the primary decoder 401 and the reduced resolution decoders 402, 403 is coupled to the input of a picture-in-picture video processing circuit which operates to combine the main picture with the reduced resolution pictures output by the reduced resolution decoders 402, 403 prior to the resulting combined picture being displayed.
>
> In one embodiment of the present invention the size of the reduced resolution pictures incorporated into the main picture is selected to be 1/4.times.1/4 the size of the normal picture. In such an embodiment, each MPEG 8 x 8 pixel block need only be decoded to a size corresponding to a block of 2 x 2 pixels.
>
> (*Boyce et al.*, Col. 17 line 55 to Col. 18 line 15)

(5) *MacInnis et al.* is not properly combinable with *Boyce et al.*

The proposed combination in the Office Action combines teachings about task scheduling in *MacInnis et al.* with teachings about video decoding in *Boyce et al.* As an alleged motivation, the Office Action (p. 5) offers the generic motivation of optimization: "reproducing video images with a resolution that is optimized to the capabilities of the client computer". Appellant submits that "optimization" is not a motivation to combine the specific features of *MacInnis et al.* and *Boyce et al.* that are relied on to reject claim 38. Obviousness can be established by combining or modifying the teachings of the prior art <u>to produce the claimed invention</u> where there is some teaching, suggestion, or <u>motivation to do so</u>. *In re Kahn*, 441 F.3d 977, 986, 78 USPQ2d 1329, 1335 (Fed. Cir. 2006) (emphasis added). In other words, the relevant motivation is that for combining the teachings in a manner that results in the claimed invention. In this case, when the specific teachings of *MacInnis et al.* and *Boyce et al.* that allegedly result in claim 38 are considered, the combination is improper for at least the following reasons.

Claim 38 does not simply recite actions related to video processing, but recites actions that are performed as part of a "resource-constrained mode", specifically: "retrieving a set of reconstructed decompressed video data…transferring the set …to a display device while downscaling the video picture in transit to the display device." Claim 38 further recites that this mode is initiated responsive to a determination. Even assuming (for the sake of argument) that *Boyce et al.* discloses the claimed video processing actions, there is no reason for a person of ordinary skill in the art to combine these actions with the "modes" allegedly taught in *MacInnis et al. MacInnis et al.* does not suggest that any video processing actions are taken in the various "modes", much less suggest that the specific video processing actions recited in claim 38 are taken in these "modes". The alleged "modes" in *MacInnis et al.* relate to tasks and *Boyce et al.* is unrelated to tasks.

(6) *Boyce et al.* is not properly combinable with *Kalra et al.*

The proposed combination in the Office Action combines teachings about video decoding in *Boyce et al.* with teachings about selecting streams for transmission to a client in *Kalra et al.* As an alleged motivation, the Office Action (p. 5) offers the generic motivation of reducing parts/cost: "implementing picture-in-picture capabilities without incurring the cost of multiple full resolution decoders". Appellant submits that "reducing cost" is not a motivation to combine the specific features of *Boyce et al.* and *Kalra et al.* that are relied on to reject claim 38. Obviousness can be established by combining or modifying the teachings of the prior art <u>to produce the claimed invention</u> where there is some teaching, suggestion, or <u>motivation to do so</u>. *In re Kahn*, 441 F.3d 977, 986, 78 USPQ2d 1329, 1335 (Fed. Cir. 2006) (emphasis added). In other words, the relevant motivation is that for combining the teachings in a manner that results in the claimed invention. In this case, when the specific teachings of *Boyce et al.* and *Kalra et al.* that allegedly result in claim 38 are considered, the combination is improper for at least the following reasons.

Claim 38 does not simply recite actions related to video processing, but recites actions that are performed as part of a "resource-constrained mode", specifically: "retrieving a set of reconstructed decompressed video data…transferring the set …to a display device while downscaling the video picture in transit to the display device." Claim 38 further recites that this mode is initiated responsive to a determination. Even assuming (for the sake of argument) that *Boyce et al.* discloses the claimed video processing actions, there is no reason for a person of ordinary skill in the art to combine these actions with the "modes" allegedly taught in *Kalra et al. Kalra et al.* does not teach or suggest that any video processing actions are taken in the various "modes", much less suggest that the specific video processing actions recited in claim 38 are taken in these "modes". The alleged "modes" in *Kalra et al.* relate to selecting video streams and *Boyce et al.* is unrelated to selecting video streams.

2. Independent Claim 53

a. The proposed combination does not teach "transferring the retrieved set of decoded frames to a display device while scaling the frames in transit to the display device…without storing the frames in the memory component"

The Office Action admits (p. 7) that *MacInnis et al.* does not disclose this feature *Kalra et al.* does not discuss downscaling at all. The Office Action alleges (p. 7) that *Boyce et al.* discloses this feature at Col. 17 lines 66-67, Col. 18 lines 1-16, Col. 2 lines 37-40, and FIG. 4. Appellant respectfully disagrees.

FIG. 4 of *Boyce et al.* is a simple block diagram of Picture-in-Picture Decoder 400, reproduced below:

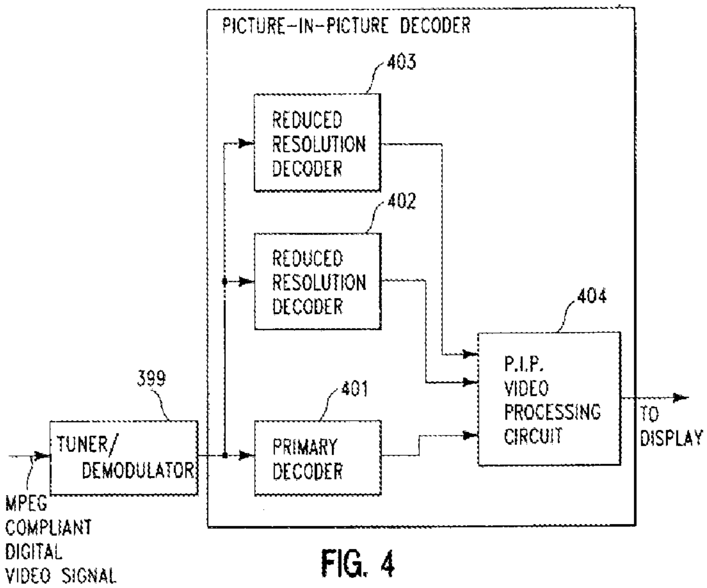

FIG. 4

Appellant assumes (for the sake of argument) that decoder 400 transfers a video picture to a display device, and also downscales the picture. However, Appellant respectfully submits that a high-level block diagram showing ***a path*** between a reduced resolution decoder, a PIP video processing circuit, and a display is not the same as the feature specifically recited in claim 53, namely: "transferring…to a display device ***while downscaling the video picture in transit*** to the display device …***without storing the frames in the memory component***."

Accordingly, the proposed combination of *MacInnis et al.* in view of *Boyce et al.* and *Kalra et al.* does not teach at least the above-described feature recited in claim 53. Therefore, a *prima facie* case establishing an obviousness rejection has not been made, and the rejection should be overturned.

b. The proposed combination does not teach "responsive to determining that one of the resource-constrained modes is to be initiated, initiating the resource-constrained mode including: retrieving…the set of decoded frames…and transferring the retrieved set of decoded frames…while scaling the frames in transit"

(1) *MacInnis et al.* does not teach this feature

The Office Action (p. 6) alleges that *MacInnis et al.* Col. 54 lines 36-48 and Col. 55 lines 8-35 teaches a resource constrained mode including retrieving and transferring as recited in claim 53. Appellant respectfully disagrees. The portion of *MacInnis et al.* relied on by the Office Action is directed to a methodology for real-time scheduling of tasks. Appellant assumes (for the sake of argument) that a task with a real-time constraint to execute within a specific time period (*MacInnis et al.*, p. 54 lines 1-25) corresponds to a "resource-constrained mode", and that a task without real-time constraint (*MacInnis et al.*, p. 55 lines 5-15) corresponds to a "non-resource constrained mode". Appellant further assumes (for the sake of argument) that determining whether the next task to be executed is a real-time task corresponds to "determining whether one of the resource-constrained modes is to be initiated", and that executing one of the real-time tasks corresponds to "responsive to determining that the resource-constrained mode is to be initiated, initiating the determined resource-constrained mode".

However, claim 53 further recites that "initiating the resource-constrained mode" includes specific actions related to video data: "retrieving…the set of decoded frames; and transferring the retrieved set of decoded frames to a display device while scaling the frames in transit…" Although *MacInnis et al.* teaches a graphics display system that retrieves, transfers, and downscales video data (Cols. 5-6), *MacInnis et al.* does <u>not</u> teach that these actions are part of a "resource-constrained mode" or that these actions are performed in response to a mode determination, as recited in claim 53. In fact, the decoding and scaling of video data in Cols. 5-6 of *MacInnis et al.* is not tied in any way to the real-time and non-real-time tasks described in Cols. 54-55 of *MacInnis et al.* Thus, even if *MacInnis et al.* discloses the individual elements

discussed above, the elements in *MacInnis et al.* are not arranged in the manner required by the language of claim 53.

(2) *Kalra et al.* does not teach this feature

The Office Action (p. 7) also alleges that *Kalra et al.* Col. 17 lines 10-67 to Col. 18 lines 1-24 teaches a resource constrained mode including retrieving and transferring as recited in claim 53. The cited portion of *Kalra et al.* refers to a “bandwidth constraint”, a “CPU constraint” and a “video preference constraint”. Thus, the Office Action (p. 7) appears to allege that the network bandwidth, CPU, and video preference constraints mentioned in *Kalra et al.* correspond to “a plurality of resource-constrained modes” as recited in claim 53. The Office Action (p. 7) appears to further allege that applying one of these constraints corresponds to operating in the resource constrained mode. Appellant respectfully disagrees.

Another portion of *Kalra et al.* describes how the constraints are applied by a server to determine which streams to transmit to a client:

> With respect to step 552 and the determination of which streams to transmit, attention is directed to the flowchart in FIG. 15B1 which indicates the steps that the server takes to determine which of the particular streams to transmit. First, in step 552A, a network bandwidth constraint is applied to determine which bandwidth is available for this particular session. Thereafter, the CPU constraint is also applied as received from the profile from the client computer in order to determine if that constraints which adaptive streams can be transmitted. Thereafter, in step 552C, the video preference is used to further limit which adaptive streams to send and thus make a determination of which adaptive stream to transmit.
> (*Kalra et al.*, Col. 16 lines 50-60)

Kalra et al. specifically teaches that all three constraints are applied, one after the other. In contrast, claim 53 teaches “***determining whether one*** of the resource constrained modes is to be initiated” and “initiating the resource-constrained mode” ***responsive to*** this determination.

(3) *Boyce et al.* does not teach this feature

The final reference, *Boyce et al.*, does not disclose, teach, or suggest a resource constrained mode, nor does the Office Action allege this.

(4) Conclusion: The proposed combination does not teach this feature

Accordingly, the proposed combination of *MacInnis et al.* in view of *Boyce et al.* and *Kalra et al.* does not teach at least the above-described features recited in claim 53. Therefore, a *prima facie* case establishing an obviousness rejection has not been made, and the rejection of claim 53 should be overturned.

c. The proposed combination is not proper

The proposed combination of *MacInnis et al.* in view of *Boyce et al.* and *Kalra et al.* is improper for at least the reasons discussed below. Therefore, a *prima facie* case establishing an obviousness rejection has not been made, and the rejection of claim 53 should be overturned.

(1) Teachings of *MacInnis et al.*

The Office Action (p. 6) relies on several passages in *MacInnis et al.* for teaching the modes recited in claim 53. These passages describe a methodology for real-time scheduling, as follows:

> The methodology used preferably implements real-time scheduling using Rate Monotonic Scheduling ("RMS"). It is a mathematical approach that allows the construction of provably correct schedules of arbitrary numbers of real-time tasks with arbitrary periods for each of the tasks. This methodology provides for a straight forward means for proof by simulation of the worst case scenario, and this simulation is simple enough that it can be done by hand. RMS, as normally applied, makes a number of simplifying assumptions in the creation of a priority list.
> (*MacInnis et al.*, Col. 54 lines 10-20)
>
> To implement real-time scheduling based on the RMS methodology, first, all of the tasks or clients that need to access memory are preferably listed, not necessarily in any particular order. Next, the period of each of the tasks is preferably determined. For those with specific bandwidth requirements (in bytes per second of memory access), the period is preferably calculated from the bandwidth and the burst size. If the deadline is different from the period for any given task, that is listed as well. The resource requirement when a task is serviced is listed along with the task. In this case, the resource requirement is the number of memory clock cycles required to service the memory access request. The tasks are sorted in order of increasing period, and the result is the set of priorities, from highest to lowest. If there are multiple tasks with the same period, they can be given different, adjacent priorities in any random relative order within the group; or they can be grouped together and served with a single priority, with round-robin arbitration between those tasks at the same priority.

> In practice, the tasks sharing the unified memory do not all have true periodic behavior. In one embodiment of the present invention, a block out timer, associated with a task that does not normally have a period, is used in order to force a bounded minimum interval, similar to a period, on that task. For example a block out timer associated with the CPU has been implemented in this embodiment. If left uncontrolled, the CPU can occupy all available memory cycles, for example by causing a never-ending stream of cache misses and memory requests. At the same time, CPU performance is determined largely by "average latency of memory access", and so the CPU performance would be less than optimal if all CPU memory accessed were consigned to a sporadic server, i.e., at the lowest priority.
>
> In this embodiment, the CPU task has been converted into two logical tasks. A first CPU task has a very high priority for low latency, and it also has a block out timer associated with it such that once a request by the CPU is made, it cannot submit a request again until the block out timer has timed out. In this embodiment, the CPU task has the top priority. In other embodiments, the CPU task may have a very high priority but not the top priority. The timer period has been made programmable for system tuning, in order to accommodate different system configurations with different memory widths or other options.
>
> (*MacInnis et al.*, Col. 55 lines 15-60)

(2) Teachings of *Kalra et al.*

The Office Action (p. 7) relies on several passages in *Kalra et al.* for teaching the modes recited in claim 53. These passages describe a process used by a server to determine which streams to transmit to a client, as follows:

> With respect to step 552 and the determination of which streams to transmit, attention is directed to the flowchart in FIG. 15B1 which indicates the steps that the server takes to determine which of the particular streams to transmit. First, in step 552A, a network bandwidth constraint is applied to determine which bandwidth is available for this particular session. Thereafter, the CPU constraint is also applied as received from the profile from the client computer in order to determine if that constraints which adaptive streams can be transmitted. Thereafter, in step 552C, the video preference is used to further limit which adaptive streams to send and thus make a determination of which adaptive stream to transmit.
>
> (*Kalra et al.*, Col. 16 lines 49-60)

(3) *MacInnis et al.* is not properly combinable with *Kalra et al.*

The proposed combination in the Office Action combines teachings about task scheduling in *MacInnis et al.* with teachings about an adaptive video stream in *Kalra et al.* As an alleged motivation, the Office Action (p. 8) offers the generic motivation of optimization: “reproducing video images with a resolution that is optimized to the capabilities of the client

computer". Appellant submits that "optimization" is not a motivation to combine the specific features of *MacInnis et al.* and *Kalra et al.* that are relied on to reject claim 53. Obviousness can be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so. *In re Kahn*, 441 F.3d 977, 986, 78 USPQ2d 1329, 1335 (Fed. Cir. 2006) (emphasis added). In other words, the relevant motivation is that for combining the teachings in a manner that results in the claimed invention. In this case, when the specific teachings of *MacInnis et al.* and *Kalra et al.* that allegedly result in claim 53 are considered, the combination is improper for at least the following reasons.

In discussing *Kalra et al.*, the Office Action (p. 7) appears to allege that network bandwidth constraints, CPU constraints, and video preference constraints correspond to "a plurality of resource-constrained modes" as recited in claim 53. In discussing *MacInnis et al.*, the Office Action (p. 6) did not allege specifically which features in *MacInnis et al.* correspond to which claimed features. Appellant assumes (for the sake of argument) that a task with a real-time constraint to execute within a specific time period (p. 54 lines 1-25 of *MacInnis et al.*) corresponds to a "resource-constrained mode" and that a task without real-time constraint (p. 55 lines 5-15 of *MacInnis et al.*) corresponds to a "non-resource constrained mode".

A person of ordinary skill in the art has no reason to combine *MacInnis et al.*'s teachings about task scheduling with *Kalra et al.*'s teachings about applying constraints in order to determine which streams are transmitted. The Office Action interprets the "modes" recited in claim 53 to correspond to attributes of tasks as taught in *MacInnis et al.*, and simultaneously to correspond to constraints as taught in *Kalra et al.* Even if the interpretation of each reference is reasonable standing alone, the combination does not make sense.

(4) Teachings of *Boyce et al.*

The Office Action (p. 7) relies upon the following passage in *Boyce et al.* for teaching the video processing actions recited in claim 53:

> The primary decoder 401 is responsible for decoding the main picture of a picture-in-picture image while the first and second decoders are responsible for generating separate images which will be displayed in a small area of the main picture. A separate reduced resolution decoder 402 or 403 is used for each additional image that is to be displayed in addition to the main picture.
>
> The output of the primary decoder 401 and the reduced resolution decoders 402, 403 is coupled to the input of a picture-in-picture video processing circuit which operates to combine the main picture with the reduced resolution pictures output by the reduced resolution decoders 402, 403 prior to the resulting combined picture being displayed.
>
> In one embodiment of the present invention the size of the reduced resolution pictures incorporated into the main picture is selected to be 1/4.times.1/4 the size of the normal picture. In such an embodiment, each MPEG 8 x 8 pixel block need only be decoded to a size corresponding to a block of 2 x 2 pixels.
>
> (*Boyce et al.*, Col. 17 line 55 to Col. 18 line 15)

(5) *MacInnis et al.* is not properly combinable with *Boyce et al.*

The proposed combination in the Office Action combines teachings about task scheduling in *MacInnis et al.* with teachings about video decoding in *Boyce et al.* As an alleged motivation, the Office Action (p. 8) offers the generic motivation of optimization: “reproducing video images with a resolution that is optimized to the capabilities of the client computer”. Appellant submits that “optimization” is not a motivation to combine the specific features of *MacInnis et al.* and *Boyce et al.* that are relied on to reject claim 53. Obviousness can be established by combining or modifying the teachings of the prior art <u>to produce the claimed invention</u> where there is some teaching, suggestion, or <u>motivation to do so</u>. *In re Kahn*, 441 F.3d 977, 986, 78 USPQ2d 1329, 1335 (Fed. Cir. 2006) (emphasis added). In other words, the relevant motivation is that for combining the teachings to produce the claimed invention. In this case, when the specific teachings of *MacInnis et al.* and *Boyce et al.* that allegedly result in claim 53 are considered, the combination is improper for at least the following reasons.

Claim 53 does not simply recite actions related to video processing, but recites actions that are performed as part of a "resource-constrained mode", specifically: "retrieving a set of reconstructed decompressed video data…transferring the set …to a display device while downscaling the video picture in transit to the display device." Claim 53 further recites that this mode is initiated responsive to a determination. Even assuming (for the sake of argument) that *Boyce et al.* discloses the claimed video processing actions, there is no reason for a person of ordinary skill in the art to combine these actions with the "modes" allegedly taught in *MacInnis et al. MacInnis et al.* does not suggest that any video processing actions are taken in the various "modes", much less suggest that the specific video processing actions recited in claim 53 are taken in these "modes". The alleged "modes" in *MacInnis et al.* relate to tasks and *Boyce et al.* is unrelated to tasks.

(6) *Boyce et al.* is not properly combinable with *Kalra et al.*

The proposed combination in the Office Action combines teachings about video decoding in *Boyce et al.* with teachings about selecting streams for transmission to a client. *Kalra et al.* As an alleged motivation, the Office Action (p. 7) offers the generic motivation of reducing parts/cost: "implementing picture-in-picture capabilities without incurring the cost of multiple full resolution decoders". Appellant submits that "reducing cost" is not a motivation to combine the specific features of *Boyce et al.* and *Kalra et al.* that are relied on to reject claim 53. Obviousness can be established by combining or modifying the teachings of the prior art <u>to produce the claimed invention</u> where there is some teaching, suggestion, or <u>motivation to do so</u>. *In re Kahn*, 441 F.3d 977, 986, 78 USPQ2d 1329, 1335 (Fed. Cir. 2006) (emphasis added). In other words, the relevant motivation is that for combining the teachings to produce the claimed invention. In this case, when the specific features of *Boyce et al.* and *Kalra et al.* that are relied on to reject claim 53 are considered, the combination is improper for at least the reasons discussed below.

Claim 53 does not simply recite actions related to video processing, but recites actions that are performed as part of a "resource-constrained mode", specifically: "retrieving a set of reconstructed decompressed video data…transferring the set …to a display device while downscaling the video picture in transit to the display device." Claim 53 further recites that this mode is initiated responsive to a determination. Even assuming (for the sake of argument) that *Boyce et al.* discloses the claimed video processing actions, there is no reason for a person of ordinary skill in the art to combine these actions with the "modes" allegedly taught in *Kalra et al. Kalra et al.* does not teach or suggest that any video processing actions are taken in the various "modes", much less suggest that the specific video processing actions recited in claim 53 are taken in these "modes". The alleged "modes" in *Kalra et al.* relate to selecting video streams but *Boyce et al.* is unrelated to selecting video streams.

3. Independent Claim 54

a. The proposed combination does not teach "logic configured to transfer the retrieved set of decoded frames to a display device while scaling the frames in transit to the display device…without storing the frames in the memory component"

The Office Action admits (p. 8) that *MacInnis et al.* does not disclose this feature. *Kalra et al.* does not discuss downscaling at all. The Office Action alleges (p. 9) that *Boyce et al.* discloses this feature at Col. 17 lines 66-67 and Col. 18 lines 1-16; Col. 2 lines 37-40; and FIG. 4. Appellant respectfully disagrees.

FIG. 4 of *Boyce et al.* is a simple block diagram of Picture-in-Picture Decoder 400, reproduced below:

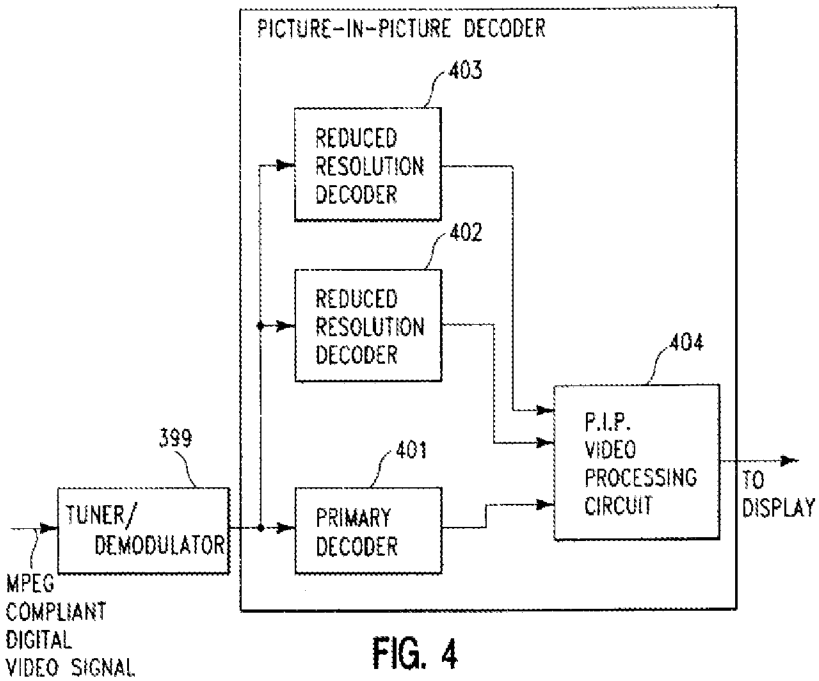

FIG. 4

Appellant assumes (for the sake of argument) that decoder 400 transfers a video picture to a display device, and also downscales the picture. However, Appellant respectfully submits that a high-level block diagram showing ***a path*** between a reduced resolution decoder, a PIP video processing circuit, and a display is not the same as the feature specifically recited in claim 54, namely: "logic configured to transfer the retrieved set of decoded frames to a display device while scaling the frames in transit to the display device…without storing the frames in the memory component".

Accordingly, the proposed combination of *MacInnis et al.* in view of *Boyce et al.* and *Kalra et al.* does not teach at least the above-described feature recited in claim 54. Therefore, a *prima facie* case establishing an obviousness rejection has not been made, and the rejection should be overturned.

b. The proposed combination does not teach "logic configured to, responsive to determining that the resource-constrained modes is to be initiated, initiate the resource-constrained mode, including: logic configured to retrieve…the

set of decoded pictures frames…and logic configured to transfer the set of decoded pictures frames…while scaling the pictures frames in transit"

(1) *MacInnis et al.* does not teach this feature

The Office Action (p. 8) alleges that *MacInnis et al.* Col. 54 lines 36-48 and Col. 55 lines 8-35 teaches a resource constrained mode including retrieving and transferring, as recited in claim 54. Appellant respectfully disagrees. The portion of *MacInnis et al.* relied on by the Office Action is directed to a methodology for real-time scheduling of tasks. Appellant assumes (for the sake of argument) that a task with a real-time constraint to execute within a specific time period (*MacInnis et al.*, p. 54 lines 1-25) corresponds to a "resource constrained mode", and that a task without real-time constraint (*MacInnis et al.*, p. 55 lines 5-15) corresponds to a "non-resource constrained mode". Appellant further assumes (for the sake of argument) that determining whether the next task to be executed is a real-time task corresponds to "logic configured to determine whether one of the resource-constrained modes is to be initiated", and that executing one of the real-time tasks corresponds to "logic configured to, responsive to determining that the resource-constrained modes is to be initiated, initiate the resource-constrained mode".

However, claim 54 further recites that "initiate the resource-constrained mode" includes specific actions related to video data: "retrieve…the set of decoded pictures frames…transfer the set of decoded pictures frames…while scaling the pictures frames in transit". Although *MacInnis et al.* teaches a graphics display system that retrieves, transfers, and downscales video data (Cols. 5-6), *MacInnis et al.* does <u>not</u> teach that these actions are part of a "resource-constrained mode" or that these actions are performed in response to a mode determination, as recited in claim 54. In fact, the decoding and scaling of video data in Cols. 5-6 of *MacInnis et al.* is not tied in any way to the real-time and non-real-time tasks described in Cols. 54-55 of *MacInnis et al.* Thus, even if *MacInnis et al.* discloses the individual elements discussed above, the elements in *MacInnis et al.* are not arranged in the manner required by the language of claim 54.

(2) *Kalra et al.* does not teach this feature

The Office Action (p. 9) also alleges that *Kalra et al.* Col. 17 lines 10-67, to Col. 18 lines 1-24 teaches a resource constrained mode including retrieving and transferring, as recited in claim 54. The cited portion of *Kalra et al.* refers to a "bandwidth constraint", a "CPU constraint" and a "video preference constraint". Thus, the Office Action (p. 7) appears to allege that the network bandwidth, CPU, and video preference constraints mentioned in *Kalra et al.* correspond to "a plurality of resource-constrained modes" as recited in claim 54. The Office Action (p. 7) appears to further allege that applying one of these constraints corresponds to operating in the resource constrained mode. Appellant respectfully disagrees.

Another portion of *Kalra et al.* describes how the constraints are applied by a server to determine which streams to transmit to a client:

> With respect to step 552 and the determination of which streams to transmit, attention is directed to the flowchart in FIG. 15B1 which indicates the steps that the server takes to determine which of the particular streams to transmit. First, in step 552A, a network bandwidth constraint is applied to determine which bandwidth is available for this particular session. Thereafter, the CPU constraint is also applied as received from the profile from the client computer in order to determine if that constraints which adaptive streams can be transmitted. Thereafter, in step 552C, the video preference is used to further limit which adaptive streams to send and thus make a determination of which adaptive stream to transmit.
> (*Kalra et al.*, Col. 16 lines 50-60)

Kalra et al. specifically teaches that all three constraints are applied, one after the other. In contrast, claim 54 teaches "logic configured to ***determine whether one*** of the resource constrained modes is to be initiated" and "logic configured to initiate the resource-constrained mode" ***responsive to*** this determination.

(3) *Boyce et al.* does not teach this feature

The final reference, *Boyce et al.*, does not disclose, teach, or suggest a resource constrained mode, nor does the Office Action allege this.

(4) Conclusion: The proposed combination does not teach this feature

Accordingly, the proposed combination of *MacInnis et al.* in view of *Boyce et al.* and *Kalra et al.* does not teach at least the above-described features recited in claim 54. Therefore, a *prima facie* case establishing an obviousness rejection has not been made, and the rejection of claim 54 should be overturned.

c. The proposed combination is not proper

The proposed combination of *MacInnis et al.* in view of *Boyce et al.* and *Kalra et al.* is improper for at least the reasons discussed below. Therefore, a *prima facie* case establishing an obviousness rejection has not been made, and the rejection of claim 54 should be overturned.

(1) Teachings of *MacInnis et al.*

The Office Action (p. 8) relies on several passages in *MacInnis et al.* for teaching the modes recited in claim 54. These passages describe a methodology for real-time scheduling, as follows:

> The methodology used preferably implements real-time scheduling using Rate Monotonic Scheduling ("RMS"). It is a mathematical approach that allows the construction of provably correct schedules of arbitrary numbers of real-time tasks with arbitrary periods for each of the tasks. This methodology provides for a straight forward means for proof by simulation of the worst case scenario, and this simulation is simple enough that it can be done by hand. RMS, as normally applied, makes a number of simplifying assumptions in the creation of a priority list.
> (*MacInnis et al.*, Col. 54 lines 10-20)

> To implement real-time scheduling based on the RMS methodology, first, all of the tasks or clients that need to access memory are preferably listed, not necessarily in any particular order. Next, the period of each of the tasks is preferably determined. For those with specific bandwidth requirements (in bytes per second of memory access), the period is preferably calculated from the bandwidth and the burst size. If the deadline is different from the period for any given task, that is listed as well. The resource requirement when a task is serviced is listed along with the task. In this case, the resource requirement is the number of memory clock cycles required to service the memory access request. The tasks are sorted in order of increasing period, and the result is the set of priorities, from highest to lowest. If there are multiple tasks with the same period, they can be given different, adjacent priorities in any random relative order within the group; or they can be grouped together and served with a single priority, with round-robin arbitration between those tasks at the same priority.

> In practice, the tasks sharing the unified memory do not all have true periodic behavior. In one embodiment of the present invention, a block out timer, associated with a task that does not normally have a period, is used in order to force a bounded minimum interval, similar to a period, on that task. For example a block out timer associated with the CPU has been implemented in this embodiment. If left uncontrolled, the CPU can occupy all available memory cycles, for example by causing a never-ending stream of cache misses and memory requests. At the same time, CPU performance is determined largely by "average latency of memory access", and so the CPU performance would be less than optimal if all CPU memory accessed were consigned to a sporadic server, i.e., at the lowest priority.
>
> In this embodiment, the CPU task has been converted into two logical tasks. A first CPU task has a very high priority for low latency, and it also has a block out timer associated with it such that once a request by the CPU is made, it cannot submit a request again until the block out timer has timed out. In this embodiment, the CPU task has the top priority. In other embodiments, the CPU task may have a very high priority but not the top priority. The timer period has been made programmable for system tuning, in order to accommodate different system configurations with different memory widths or other options.
>
> (*MacInnis et al.*, Col. 55 lines 15-60)

(2) Teachings of *Kalra et al.*

The Office Action (p. 9) relies on several passages in *Kalra et al.* for teaching the modes recited in claim 54. These passages describe a process used by a server to determine which streams to transmit to a client, as follows:

> With respect to step 552 and the determination of which streams to transmit, attention is directed to the flowchart in FIG. 15B1 which indicates the steps that the server takes to determine which of the particular streams to transmit. First, in step 552A, a network bandwidth constraint is applied to determine which bandwidth is available for this particular session. Thereafter, the CPU constraint is also applied as received from the profile from the client computer in order to determine if that constraints which adaptive streams can be transmitted. Thereafter, in step 552C, the video preference is used to further limit which adaptive streams to send and thus make a determination of which adaptive stream to transmit.
>
> (*Kalra et al.*, Col. 16 lines 49-60)

(3) *MacInnis et al.* is not properly combinable with *Kalra et al.*

The proposed combination in the Office Action combines teachings about task scheduling in *MacInnis et al.* with teachings about an adaptive video stream in *Kalra et al.* As an alleged motivation, the Office Action (p. 8) offers the generic motivation of optimization: "reproducing video images with a resolution that is optimized to the capabilities of the client

computer”. Appellant submits that “optimization” is not a motivation to combine the specific features of *MacInnis et al.* and *Kalra et al.* that are relied on to reject claim 54. Obviousness can be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so. *In re Kahn*, 441 F.3d 977, 986, 78 USPQ2d 1329, 1335 (Fed. Cir. 2006) (emphasis added). In other words, the relevant motivation is that for combining the teachings to produce the claimed invention. In this case, when the specific teachings of *MacInnis et al.* and *Kalra et al.* that allegedly result in claim 54 are considered, the combination is improper for at least the following reasons.

In discussing *Kalra et al.*, the Office Action (p. 8) appears to allege that network bandwidth constraints, CPU constraints, and video preference constraints correspond to “a plurality of resource-constrained modes” as recited in claim 54. In discussing *MacInnis et al.*, the Office Action (p. 8) did not allege specifically which features in *MacInnis et al.* correspond to which claimed features. Appellant assumes (for the sake of argument) that a task with a real-time constraint to execute within a specific time period (p. 54 lines 1-25 of *MacInnis et al.*) corresponds to a “resource-constrained mode” and that a task without real-time constraint (p. 55 lines 5-15 of *MacInnis et al.*) corresponds to a “non-resource constrained mode”.

A person of ordinary skill in the art has no reason to combine *MacInnis et al.*’s teachings about task scheduling with *Kalra et al.*’s teachings about applying constraints in order to determine which streams are transmitted. The Office Action interprets the “modes” recited in claim 54 to correspond to attributes of tasks as taught in *MacInnis et al.*, and simultaneously to correspond to constraints as taught in *Kalra et al.* Even if the interpretation of each reference is reasonable standing alone, the combination does not make sense.

(4) Teachings of *Boyce et al.*

The Office Action relies upon the following passage in *Boyce et al.* for teaching the video processing actions recited in claim 54:

> The primary decoder 401 is responsible for decoding the main picture of a picture-in-picture image while the first and second decoders are responsible for generating separate images which will be displayed in a small area of the main picture. A separate reduced resolution decoder 402 or 403 is used for each additional image that is to be displayed in addition to the main picture.
>
> The output of the primary decoder 401 and the reduced resolution decoders 402, 403 is coupled to the input of a picture-in-picture video processing circuit which operates to combine the main picture with the reduced resolution pictures output by the reduced resolution decoders 402, 403 prior to the resulting combined picture being displayed.
>
> In one embodiment of the present invention the size of the reduced resolution pictures incorporated into the main picture is selected to be 1/4.times.1/4 the size of the normal picture. In such an embodiment, each MPEG 8 x 8 pixel block need only be decoded to a size corresponding to a block of 2 x 2 pixels.
>
> (*Boyce et al.*, Col. 17 line 55 to Col. 18 line 15)

(5) *MacInnis et al.* is not properly combinable with *Boyce et al.*

The proposed combination in the Office Action combines teachings about task scheduling in *MacInnis et al.* with teachings about video decoding in *Boyce et al.* As an alleged motivation, the Office Action (p. 7) offers the generic motivation of optimization: “reproducing video images with a resolution that is optimized to the capabilities of the client computer”. Appellant submits that “optimization” is not a motivation to combine the specific features of *MacInnis et al.* and *Boyce et al.* that are relied on to reject claim 54. Obviousness can be established by combining or modifying the teachings of the prior art <u>to produce the claimed invention</u> where there is some teaching, suggestion, or <u>motivation to do so</u>. *In re Kahn*, 441 F.3d 977, 986, 78 USPQ2d 1329, 1335 (Fed. Cir. 2006) (emphasis added). In other words, the relevant motivation is that for combining the teachings to produce the claimed invention. In this case, when the specific teachings of *MacInnis et al.* and *Boyce et al.* that allegedly result in claim 54 are considered, the combination is improper for at least the following reasons.

Claim 54 does not simply recite actions related to video processing, but recites actions that are performed as part of a "resource-constrained mode", specifically: "retrieving a set of reconstructed decompressed video data…transferring the set …to a display device while downscaling the video picture in transit to the display device." Claim 54 further recites that this mode is initiated responsive to a determination. Even assuming (for the sake of argument) that *Boyce et al.* discloses the claimed video processing actions, there is no reason for a person of ordinary skill in the art to combine these actions with the "modes" allegedly taught in *MacInnis et al. MacInnis et al.* does not suggest that any video processing actions are taken in the various "modes", much less suggest that the specific video processing actions recited in claim 54 are taken in these "modes". The alleged "modes" in *MacInnis et al.* relate to tasks and *Boyce et al.* is unrelated to tasks.

(6) *Boyce et al.* is not properly combinable with *Kalra et al.*

The proposed combination in the Office Action combines teachings about video decoding in *Boyce et al.* with teachings about selecting streams for transmission to a client. *Kalra et al.* As an alleged motivation, the Office Action (p. 9) offers the generic motivation of reducing parts/cost: "implementing picture-in-picture capabilities without incurring the cost of multiple full resolution decoders". Appellant submits that "reducing cost" is not a motivation to combine the specific features of *Boyce et al.* and *Kalra et al.* that are relied on to reject claim 54. Obviousness can be established by combining or modifying the teachings of the prior art <u>to produce the claimed invention</u> where there is some teaching, suggestion, or <u>motivation to do so</u>. *In re Kahn*, 441 F.3d 977, 986, 78 USPQ2d 1329, 1335 (Fed. Cir. 2006) (emphasis added). In other words, the relevant motivation is that for combining the teachings to produce the claimed invention. In this case, when the specific teachings of *Boyce et al.* and *Kalra et al.* that allegedly result in claim 54 are considered, the combination is improper for at least the following reasons.

Claim 54 does not simply recite actions related to video processing, but recites actions that are performed as part of a "resource-constrained mode", specifically: "logic configured to

retrieve…the set of decoded frames; and logic configured to transfer the set of decoded frames to a display device while scaling the frames in transit…”. Claim 54 further recites that this mode is initiated responsive to a determination. Even assuming (for the sake of argument) that *Boyce et al.* discloses the claimed video processing actions, there is no reason for a person of ordinary skill in the art to combine these actions with the “modes” allegedly taught in *Kalra et al. Kalra et al.* does not suggest that any video processing actions are taken in the various “modes”, much less suggest that the specific video processing actions recited in claim 54 are taken in these “modes”. The alleged “modes” in *Kalra et al.* relate to selecting video streams but *Boyce et al.* is unrelated to selecting video streams.

4. Independent Claims 55 and 66

a. The proposed combination does not teach “transferring the retrieved video frames to a display device while downscaling the picture in transit to the display device”

The Office Action admits (p. 8) that *MacInnis et al.* does not disclose this feature. *Kalra et al.* does not discuss downscaling at all. The Office Action alleges (p. 9) that *Boyce et al.* discloses this feature at Col. 17 lines 66-67 and Col. 18 lines 1-16; Col. 2 lines 37-40; and FIG. 4. Appellant respectfully disagrees.

FIG. 4 of *Boyce et al.* is a simple block diagram of Picture-in-Picture Decoder 400, reproduced below:

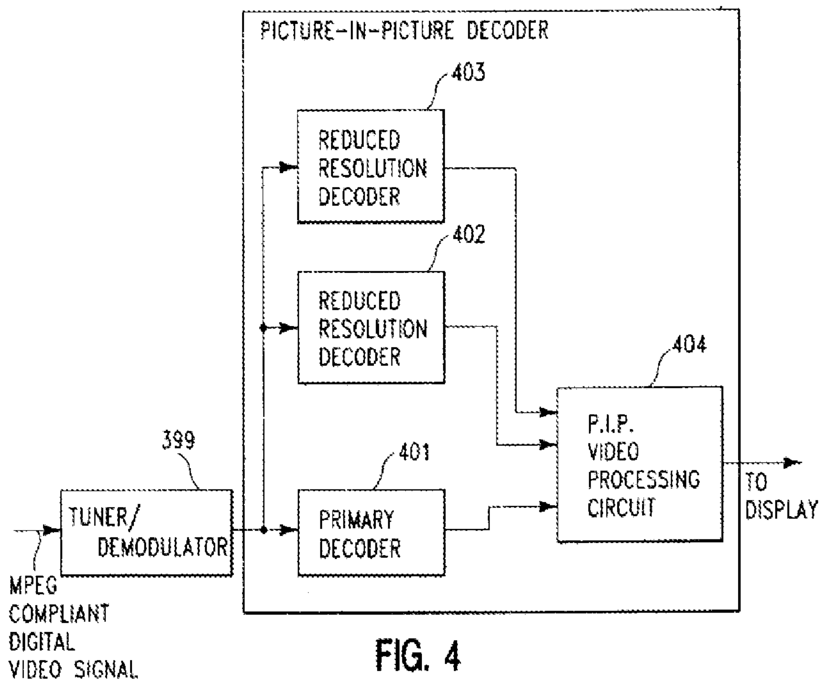

FIG. 4

Appellant assumes (for the sake of argument) that decoder 400 transfers a video picture to a display device, and also downscales the picture. However, Appellant respectfully submits that a high-level block diagram showing ***a path*** between a reduced resolution decoder, a PIP video processing circuit, and a display is not the same as the feature specifically recited in claims 55 and 66, namely: "transferring…to a display device ***while downscaling the picture in transit*** to the display device."

Accordingly, the proposed combination of *MacInnis et al.* in view of *Boyce et al.* and *Kalra et al.* does not teach at least the above-described feature recited in claims 55 and 66. Therefore, a *prima facie* case establishing an obviousness rejection has not been made, and the rejection should be overturned.

b. The proposed combination does not teach "responsive to determining that one of the resource-constrained modes is to be initiated, initiating the determined resource-constrained mode, including: retrieving the video frames…and transferring the retrieved video frames…"

(1) *MacInnis et al.* does not teach this feature

The Office Action (p. 8) alleges that *MacInnis et al.* Col. 54 lines 36-48 and Col. 55 lines 8-35 teaches a resource constrained mode including retrieving and transferring, as recited in claims 55 and 66. Appellant respectfully disagrees. The portion of *MacInnis et al.* relied on by the Office Action is directed to a methodology for real-time scheduling of tasks. Appellant assumes (for the sake of argument) that a task with a real-time constraint to execute within a specific time period (*MacInnis et al.*, p. 54 lines 1-25) corresponds to a "resource-constrained mode", and that a task without real-time constraint (*MacInnis et al.*, p. 55 lines 5-15) corresponds to a "non-resource constrained mode". Appellant further assumes (for the sake of argument) that determining whether the next task to be executed is a real-time task corresponds to "determining whether one of the resource-constrained modes is to be initiated", and that executing one of the real-time tasks corresponds to "responsive to determining that the resource-constrained mode is to be initiated, initiating the resource-constrained mode".

However, claims 55 and 66 further recite that "initiating the resource-constrained mode" includes specific actions related to video data: "retrieving the video frames…and transferring the retrieved video frames to a display device while downscaling the video picture in transit…" Although *MacInnis et al.* teaches a graphics display system that retrieves, transfers, and downscales video data (Cols. 5-6), *MacInnis et al.* does <u>not</u> teach that these actions are part of a "resource-constrained mode" or that these actions are performed in response to a mode determination, as recited in claims 55 and 66. In fact, the decoding and scaling of video data in Cols. 5-6 of *MacInnis et al.* is not tied in any way to the real-time and non-real-time tasks described in Cols. 54-55 of *MacInnis et al.* Thus, even if *MacInnis et al.* discloses the individual elements discussed above, the elements in *MacInnis et al.* are not arranged in the manner required by the language of claims 55 and 66.

(2) *Kalra et al.* does not teach this feature

The Office Action (p. 9) also alleges that *Kalra et al.* Col. 17 lines 10-67 to Col. 18 lines 1-24 teaches a resource constrained mode including retrieving and transferring, as recited in claims 55 and 66. The cited portion of *Kalra et al.* refers to a "bandwidth constraint", a "CPU constraint" and a "video preference constraint". Thus, the Office Action (p. 7) appears to allege that the network bandwidth, CPU, and video preference constraints mentioned in *Kalra et al.* correspond to "a plurality of resource-constrained modes" as recited in claims 55 and 66. The Office Action (p. 7) appears to further allege that applying one of these constraints corresponds to operating in the resource constrained mode. Appellant respectfully disagrees.

Another portion of *Kalra et al.* describes how the constraints are applied by a server to determine which streams to transmit to a client:

> With respect to step 552 and the determination of which streams to transmit, attention is directed to the flowchart in FIG. 15B1 which indicates the steps that the server takes to determine which of the particular streams to transmit. First, in step 552A, a network bandwidth constraint is applied to determine which bandwidth is available for this particular session. Thereafter, the CPU constraint is also applied as received from the profile from the client computer in order to determine if that constraints which adaptive streams can be transmitted. Thereafter, in step 552C, the video preference is used to further limit which adaptive streams to send and thus make a determination of which adaptive stream to transmit.
> (*Kalra et al.*, Col. 16 lines 50-60)

Kalra et al. specifically teaches that all three constraints are applied, one after the other. In contrast, claims 55 and 66 recite "***determining whether one*** of the resource constrained modes is to be initiated" and "initiating the resource-constrained mode" ***responsive to*** this determination.

(3) *Boyce et al.* does not teach this feature

The final reference, *Boyce et al.*, does not disclose, teach, or suggest a resource constrained mode, nor does the Office Action allege this.

(4) Conclusion: The proposed combination does not teach this feature

Accordingly, the proposed combination of *MacInnis et al.* in view of *Boyce et al.* and *Kalra et al.* does not teach at least the above-described features recited in claims 55 and 66. Therefore, a *prima facie* case establishing an obviousness rejection has not been made, and the rejection of claims 55 and 66 should be overturned.

c. The proposed combination is not proper

The proposed combination of *MacInnis et al.* in view of *Boyce et al.* and *Kalra et al.* is improper for at least the reasons discussed below. Therefore, a *prima facie* case establishing an obviousness rejection has not been made, and the rejection of claims 55 and 66 should be overturned.

(1) Teachings of ***MacInnis et al.***

The Office Action (p. 8) relies on several passages in *MacInnis et al.* for teaching the modes recited in claims 55 and 66. These passages describe a methodology for real-time scheduling, as follows:

> The methodology used preferably implements real-time scheduling using Rate Monotonic Scheduling ("RMS"). It is a mathematical approach that allows the construction of provably correct schedules of arbitrary numbers of real-time tasks with arbitrary periods for each of the tasks. This methodology provides for a straight forward means for proof by simulation of the worst case scenario, and this simulation is simple enough that it can be done by hand. RMS, as normally applied, makes a number of simplifying assumptions in the creation of a priority list.
> (*MacInnis et al.*, Col. 54 lines 10-20)
>
> To implement real-time scheduling based on the RMS methodology, first, all of the tasks or clients that need to access memory are preferably listed, not necessarily in any particular order. Next, the period of each of the tasks is preferably determined. For those with specific bandwidth requirements (in bytes per second of memory access), the period is preferably calculated from the bandwidth and the burst size. If the deadline is different from the period for any given task, that is listed as well. The resource requirement when a task is serviced is listed along with the task. In this case, the resource requirement is the number of memory clock cycles required to service the memory access request. The tasks are sorted in order of increasing period, and the result is the set of priorities, from highest to lowest. If there are multiple tasks with the same period, they can be given different, adjacent priorities in any random relative order within the group; or they can be grouped together and served

> with a single priority, with round-robin arbitration between those tasks at the same priority.
>
> In practice, the tasks sharing the unified memory do not all have true periodic behavior. In one embodiment of the present invention, a block out timer, associated with a task that does not normally have a period, is used in order to force a bounded minimum interval, similar to a period, on that task. For example a block out timer associated with the CPU has been implemented in this embodiment. If left uncontrolled, the CPU can occupy all available memory cycles, for example by causing a never-ending stream of cache misses and memory requests. At the same time, CPU performance is determined largely by "average latency of memory access", and so the CPU performance would be less than optimal if all CPU memory accessed were consigned to a sporadic server, i.e., at the lowest priority.
>
> In this embodiment, the CPU task has been converted into two logical tasks. A first CPU task has a very high priority for low latency, and it also has a block out timer associated with it such that once a request by the CPU is made, it cannot submit a request again until the block out timer has timed out. In this embodiment, the CPU task has the top priority. In other embodiments, the CPU task may have a very high priority but not the top priority. The timer period has been made programmable for system tuning, in order to accommodate different system configurations with different memory widths or other options.
>
> (*MacInnis et al.*, Col. 55 lines 15-60)

(2) Teachings of *Kalra et al.*

The Office Action (p. 9) relies on several passages in *Kalra et al.* for teaching the modes recited in claims 55 and 66. These passages describe a process used by a server to determine which streams to transmit to a client, as follows:

> With respect to step 552 and the determination of which streams to transmit, attention is directed to the flowchart in FIG. 15B1 which indicates the steps that the server takes to determine which of the particular streams to transmit. First, in step 552A, a network bandwidth constraint is applied to determine which bandwidth is available for this particular session. Thereafter, the CPU constraint is also applied as received from the profile from the client computer in order to determine if that constraints which adaptive streams can be transmitted. Thereafter, in step 552C, the video preference is used to further limit which adaptive streams to send and thus make a determination of which adaptive stream to transmit.
>
> (*Kalra et al.*, Col. 16 lines 49-60)

(3) *MacInnis et al.* is not properly combinable with *Kalra et al.*

The proposed combination in the Office Action combines teachings about task scheduling in *MacInnis et al.* with teachings about an adaptive video stream in *Kalra et al.* As an alleged motivation, the Office Action (p. 9) offers the generic motivation of optimization:

"reproducing video images with a resolution that is optimized to the capabilities of the client computer". Appellant submits that "optimization" is not a motivation to combine the specific features of *MacInnis et al.* and *Kalra et al.* that are relied on to reject claims 55 and 66. Obviousness can be established by combining or modifying the teachings of the prior art <u>to produce the claimed invention</u> where there is some teaching, suggestion, or <u>motivation to do so</u>. *In re Kahn*, 441 F.3d 977, 986, 78 USPQ2d 1329, 1335 (Fed. Cir. 2006) (emphasis added). In other words, the relevant motivation is that for combining the teachings to produce the claimed invention. In this case, when the specific teachings of *MacInnis et al.* and *Kalra et al.* that allegedly result in claims 55 and 66 are considered, the combination is improper for at least the following reasons.

In discussing *Kalra et al.*, the Office Action (p. 9) appears to allege that network bandwidth constraints, CPU constraints, and video preference constraints correspond to "a plurality of resource-constrained modes" as recited in claims 55 and 66. In discussing *MacInnis et al.*, the Office Action (p. 3) did not allege specifically which features in *MacInnis et al.* correspond to which claimed features. Appellant assumes (for the sake of argument) that a task with a real-time constraint to execute within a specific time period (p. 54 lines 1-25 of *MacInnis et al.*) corresponds to a "resource-constrained mode" and that a task without real-time constraint (p. 55 lines 5-15 of *MacInnis et al.*) corresponds to a "non-resource constrained mode".

A person of ordinary skill in the art has no reason to combine *MacInnis et al.*'s teachings about task scheduling with *Kalra et al.*'s teachings about applying constraints in order to determine which streams are transmitted. The Office Action interprets the "modes" recited in claims 55 and 66 to correspond to attributes of tasks as taught in *MacInnis et al.*, and simultaneously to correspond to constraints as taught in *Kalra et al.* Even if the interpretation of each reference is reasonable standing alone, the combination does not make sense.

(4) Teachings of *Boyce et al.*

The Office Action (p. 9) relies upon the following passage in *Boyce et al.* for teaching the video processing actions recited in claims 55 and 66:

> The primary decoder 401 is responsible for decoding the main picture of a picture-in-picture image while the first and second decoders are responsible for generating separate images which will be displayed in a small area of the main picture. A separate reduced resolution decoder 402 or 403 is used for each additional image that is to be displayed in addition to the main picture.
>
> The output of the primary decoder 401 and the reduced resolution decoders 402, 403 is coupled to the input of a picture-in-picture video processing circuit which operates to combine the main picture with the reduced resolution pictures output by the reduced resolution decoders 402, 403 prior to the resulting combined picture being displayed.
>
> In one embodiment of the present invention the size of the reduced resolution pictures incorporated into the main picture is selected to be 1/4.times.1/4 the size of the normal picture. In such an embodiment, each MPEG 8 x 8 pixel block need only be decoded to a size corresponding to a block of 2 x 2 pixels.
>
> (*Boyce et al.*, Col. 17 line 55 to Col. 18 line 15)

(5) *MacInnis et al.* is not properly combinable with *Boyce et al.*

The proposed combination in the Office Action combines teachings about task scheduling in *MacInnis et al.* with teachings about video decoding in *Boyce et al.* As an alleged motivation, the Office Action (p. 9) offers the generic motivation of optimization: “reproducing video images with a resolution that is optimized to the capabilities of the client computer”. Appellant submits that “optimization” is not a motivation to combine the specific features of *MacInnis et al.* and *Boyce et al.* that are relied on to reject claims 55 and 66. Obviousness can be established by combining or modifying the teachings of the prior art <u>to produce the claimed invention</u> where there is some teaching, suggestion, or <u>motivation to do so</u>. *In re Kahn*, 441 F.3d 977, 986, 78 USPQ2d 1329, 1335 (Fed. Cir. 2006) (emphasis added). In other words, the relevant motivation is that for combining the teachings to produce the claimed invention. In this case, when the specific teachings of *MacInnis et al.* and *Boyce et al.* that allegedly result in claims 55 and 66 are considered, the combination is improper for at least the following reasons.

Claims 55 and 66 does not simply recite actions related to video processing, but recites actions that are performed as part of a “resource-constrained mode”, specifically: “retrieving the video data frames from the memory component; and transferring the retrieved video data frames to a display device while downscaling the video picture in transit to the display device”. Claims 55 and 66 further recites that this mode is initiated responsive to a determination. Even assuming (for the sake of argument) that *Boyce et al.* discloses the claimed video processing actions, there is no reason for a person of ordinary skill in the art to combine these actions with the “modes” allegedly taught in *MacInnis et al. MacInnis et al.* does not teach or suggest that any video processing actions are taken in the various “modes”, much less suggest that the specific video processing actions recited in claims 55 and 66 are taken in these “modes”. The alleged “modes” in *MacInnis et al.* relate to tasks but *Boyce et al.* is unrelated to tasks.

(6) *Boyce et al.* is not properly combinable with *Kalra et al.*

The proposed combination in the Office Action combines teachings about video decoding in *Boyce et al.* with teachings about selecting streams for transmission to a client. *Kalra et al.* As an alleged motivation, the Office Action (p. 9) offers the generic motivation of reducing parts/cost: “implementing picture-in-picture capabilities without incurring the cost of multiple full resolution decoders”. Appellant submits that “reducing cost” is not a motivation to combine the specific features of *Boyce et al.* and *Kalra et al.* that are relied on to reject claims 55 and 66. Obviousness can be established by combining or modifying the teachings of the prior art <u>to produce the claimed invention</u> where there is some teaching, suggestion, or <u>motivation to do so</u>. *In re Kahn*, 441 F.3d 977, 986, 78 USPQ2d 1329, 1335 (Fed. Cir. 2006) (emphasis added). In other words, the relevant motivation is that for combining the teachings to produce the claimed invention. n this case, when the specific teachings of *Boyce et al.* and *Kalra et al.* that allegedly result in claims 55 and 66 are considered, the combination is improper for at least the following reasons.

Claims 55 and 66 do not simply recite actions related to video processing, but recites actions that are performed as part of a “resource-constrained mode”, specifically: “retrieving the video data frames from the memory component; and transferring the retrieved video data frames to a display device while downscaling the video picture in transit to the display device”. Claims 55 and 66 further recite that this mode is initiated responsive to a determination. Even assuming (for the sake of argument) that *Boyce et al.* discloses the claimed video processing actions, there is no reason for a person of ordinary skill in the art to combine these actions with the “modes” allegedly taught in *Kalra et al. Kalra et al.* does not teach or suggest that any video processing actions are taken in the various “modes”, much less suggest that the specific video processing actions recited in claims 55 and 66 are taken in these “modes”. The alleged “modes” in *Kalra et al.* relate to selecting video streams and *Boyce et al.* is unrelated to selecting video streams.

5. Dependent Claims 67-78, 80-82, and 85-88

Since independent claims 38, 53, 54, 55, and 66 are allowable, Appellant respectfully submits that claims 67-78, 80-82, and 85-88 are allowable for at least the reason that each depends from an allowable claim. *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q. 2d 1596, 1598 (Fed. Cir. 1988). Therefore, Appellant respectfully requests that the rejection of claims 67-78, 80-82, and 85-88 be overturned.

C. Conclusion

For at least the reasons discussed above, Appellants respectfully request that the Examiner's final rejection of claims 38, 53-55, 66-78, 80-82, and 85-88 be overturned by the Board, and that the application be allowed to issue as a patent with pending claims 38, 53-55, 66-78, 80-82, and 85-88.

In addition to the claims listed in Section VIII (CLAIMS – APPENDIX), Section IX (EVIDENCE – APPENDIX) included herein indicates that there is no additional evidence relied upon by this brief. Section X (RELATED PROCEEDINGS – APPENDIX) included herein indicates that there are no related proceedings.

Respectfully submitted,

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VIII. CLAIMS – APPENDIX

38. A method for adapting to resource constraints of a digital home communication terminal (DHCT), said method comprising steps of:

providing a digital home communication terminal (DHCT), wherein said DHCT is configured to operate in a non-resource constrained mode and a plurality of resource constrained modes;

determining whether one of the resource-constrained modes or the non-resource constrained mode is to be initiated;

responsive to determining that one of the resource-constrained modes is to be initiated, operating the DHCT in the determined resource-constrained mode, including:

retrieving a set of reconstructed decompressed video frames from a first portion of a memory component, wherein the memory component stores compressed video frames in a distinct second portion, wherein the set of video frames corresponds to a video picture; and

transferring the set of retrieved reconstructed decompressed video frames to a display device while downscaling the video picture in transit to the display device.

53. A method for adapting to resource constraints of a digital communication terminal (DHCT), said method comprising steps of:

providing a digital home communication terminal (DHCT), wherein said DHCT is configured to operate in a non-resource constrained mode and a plurality of resource-constrained modes;

determining whether one of the resource-constrained modes is to be initiated;

responsive to determining that one of the resource-constrained modes is to be initiated, initiating the resource-constrained mode, including:

retrieving, from a first portion of a memory component, a set of compressed frames;

storing, in a second and distinct portion of the memory component, a set of decoded frames corresponding to the set of compressed frames, each of the set of decoded frames being at a first spatial resolution;

retrieving, from the second and distinct portion of the memory component, the set of decoded frames; and

transferring the retrieved set of decoded frames to a display device while scaling the frames in transit to the display device to a second spatial resolution without storing the frames in the memory component, wherein the second spatial resolution is smaller than the first spatial resolution.

54. A digital home communication terminal (DHCT) comprising :

logic configured to operate the DHCT in a non-resource constrained mode and a plurality of resource-constrained modes;

logic configured to determine whether one of the resource-constrained modes is to be initiated;

logic configured to, responsive to determining that the resource-constrained modes is to be initiated, initiate the resource-constrained mode, including:

logic configured to retrieve, from a first portion of a memory component, a set of compressed frames;

logic configured to store, in a second and distinct portion of the memory component, a set of decoded frames corresponding to the set of compressed frames, each of the set of decoded frames being at a first spatial resolution;

logic configured to retrieve, from the memory component, the set of decoded frames; and

logic configured to transfer the set of decoded frames to a display device while scaling the frames in transit to the display device to a second spatial resolution without storing

the frames in the memory component, wherein the second spatial resolution is smaller than the first spatial resolution.

55. A method for adapting to resource constraints of a digital home communication terminal (DHCT), said method comprising steps of:

providing a digital home communication terminal (DHCT), wherein DHCT is configured to operate in a non-resource constrained mode and a plurality of resource-constrained modes;

receiving, in a memory component, video frames comprising a complete picture;

determining whether one of the resource-constrained modes is to be initiated;

responsive to determining that one of the resource-constrained modes is to be initiated, initiating the resource-constrained mode, including:

retrieving the video frames from the memory component; and

transferring the retrieved video frames to a display device while downscaling the picture in transit to the display device.

66. A computer readable medium containing a program for use in a digital home communication terminal (DHCT) to adapt to resource constraints, the program comprising logic for performing the steps of:

providing a digital home communication terminal (DHCT), wherein DHCT is configured to operate in a non-resource constrained mode and a plurality of resource-constrained modes;

receiving, in a memory component, video frames comprising a complete picture;

determining whether one of the resource-constrained modes is to be initiated;

responsive to determining that one of the resource-constrained modes is to be initiated, initiating the resource-constrained mode, including:

retrieving the video frames from the memory component; and

transferring the retrieved video frames to a display device while downscaling the picture in transit to the display device.

67. The computer readable medium of claim 66, the program further comprising logic for performing the step of:

transmitting graphics data to the display device, wherein the graphics data is displayed contemporaneously with the scaled video frames.

68. The computer readable medium of claim 66, wherein the downscaling comprises horizontal scaling.

69. The computer readable medium of claim 66, wherein the downscaling comprises vertical scaling.

70. The computer readable medium of claim 66, wherein the downscaled picture is not stored in the memory component.

71. The method of claim 38, further comprising:

transmitting graphics data to the display device, wherein the graphics data is displayed contemporaneously with the downscaled picture.

72. The method of claim 38, wherein the downscaling comprises horizontal scaling.

73. The method of claim 38, wherein the downscaling comprises vertical scaling.

74. The method of claim 53, further comprising the step of:

transmitting graphics data to the display device, wherein the graphics data is displayed contemporaneously with the scaled video frames.

75. The method of claim 53, wherein the scaling comprises downscaling.

76. The method of claim 53, wherein the scaling comprises horizontal scaling.

77. The method of claim 53, wherein the scaling comprises vertical scaling.

78. The DHCT of claim 54, wherein the system is further configured to:

transmit graphics data to the display device, wherein the graphics data is displayed contemporaneously with the scaled frames.

80. The DHCT of claim 54, wherein the scaling comprises horizontal downscaling.

81. The DHCT of claim 54, wherein the scaling comprises vertical downscaling.

82. The method of claim 55, further comprising the step of:

transmitting graphics data to the display device, wherein the graphics data is displayed contemporaneously with the scaled video frames.

85. The method of claim 38, wherein the plurality of resource-constrained modes include a memory-constrained mode, a bus bandwidth constrained mode, and a memory and bus-bandwidth constrained mode.

86. The method of claim 53, wherein the plurality of resource-constrained modes include a memory-constrained mode, a bus bandwidth constrained mode, and a memory and bus-bandwidth constrained mode.

87. The DHCT of claim 54, wherein the plurality of resource-constrained modes include a memory-constrained mode, a bus bandwidth constrained mode, and a memory and bus-bandwidth constrained mode.

88. The method of claim 55, wherein the plurality of resource-constrained modes include a memory-constrained mode, a bus bandwidth constrained mode, and a memory and bus-bandwidth constrained mode.

IX. EVIDENCE – APPENDIX

None.

X. RELATED PROCEEDINGS – APPENDIX

None.